CBM MATE NODE 1 ZENITH

OBJECTIVE:
Mate Z1 TRUSS to Node1 Zenith port using Common Berthing Mechanism
 (CBM).

LOCATION:
NOD1/AFD EPCS

DURATION:
TBD

REFERENCED PROCEDURE(S):
Z1 INSTALL (PDRS OPERATIONS CHECKLIST)

WARNING
To prevent damage to Active CBM (ACBM), free drift thruster inhibit is required from initiation of CBM capture latch operation until eight bolts reach tensile load of 6672 N/1500 lbs. SRMS shall remain grappled to Z1 TRUSS until such time.

1. VERIFY SECONDARY RPCs CLOSED

PCS   Node 1: S&M: Zenith CBM
        | Node 1 Zenith CBM Display |
        'RPCM N14B B Secondary Power'

       √RPC Posn (four) - Cl

2. VERIFY CBM STATUS
        | Node 1 Zenith CBM Display |
        'CBM Status'

       √Mode - Activated
       √Master - Secondary
       √Comm Error - No X
       √Master Cmd Status - Complete

        'Capture Latch Status'

       √Posn (four) = 205

        'CBM Graphic'

       √RTL (four) - gray

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                              NOTE
          Step 3 is performed following SRMS translation of
          the Z1 TRUSS into the CBM capture envelope.
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3. <u>VERIFY READY TO LATCH INDICATORS (RTLs) CLOSED</u>

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                              NOTE
          Capture sequence may be initiated with three of four
          RTLs closed.  In this case, the latch associated with
          the open RTL must be masked.  The mask command
          for Latch X is accessed by selecting the Latch X button
          on the CBM depiction, selecting the Commands button
          from the pop-up window, and executing the Mask
          Latch X command.
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√Step 3 of Z1 INSTALL complete (PDRS Checklist)

| Node 1 Zenith CBM Display |
'CBM Graphic'

√RTL (four) - green

4. <u>PERFORM FIRST STAGE CAPTURE</u>
    DAP: √FREE

| Node 1 Zenith CBM Display |
'Command Sets'

sel Mate

| Node 1 Zenith CBM Mate |

sel Capture First Stage

| Node 1 CBM Capture First Stage |

cmd Capture First Stage
√Confirmation Request - Capture
cmd Confirm Cmd
Wait 15 seconds.

√Master Cmd Status - Complete
√Cmd Code (four) - Capture
√Cmd Status (four) - Complete
√Posn (four): 148 --- 150

5. <u>PERFORM SECOND STAGE CAPTURE</u>
    √Step 4 of Z1 INSTALL complete (PDRS Checklist)

    Node 1 Zenith CBM Mate

    sel Capture Second Stage

    Node 1 CBM Capture Second Stage

    cmd Capture Second Stage
    √Confirmation Request - Capture
    cmd Confirm Cmd
    Wait 60 seconds.

    √Master Cmd Status - Complete
    √Cmd Code (four) - Capture
    √Cmd Status (four) - Complete
    √Posn (four): 6 --- 8

6. <u>PREPOSITION FIRST SET OF FOUR BOLTS</u>
    √Step 5 of Z1 INSTALL complete (PDRS Checklist)

    Node 1 Zenith CBM Mate

    sel Position First Four Bolts

    Node 1 CBM Position First Four Bolts

    cmd Position First Four
    √Confirmation Request - ABolts

    cmd Confirm Cmd
    Wait 1 minute.
    √Master Cmd Status - Fail
    √Cmd Code (four) - ABolts or Stop
    √Cmd Status (four) - Not Engaged or Complete
    √Load (four): 0

    cmd Stop
    √Master Cmd Status - Complete
    √Cmd Code (four) - Stop
    √Cmd Status (four) - Complete

7. ACQUIRE BOLTS

    | Node 1 Zenith CBM Mate |

    sel Acquire Bolts

    | Node 1 CBM Acquire Bolts |

    cmd ABolts Nominal
    √Confirmation Request - ABolts

    cmd Confirm Cmd
    Wait 7 minutes.
    √Master Cmd Status - Complete
    √Cmd Code (sixteen) - ABolts
    √Cmd Status (sixteen) - Complete
    √Load (sixteen): 0 --- 6700

    DAP: AUTO

8. PERFORM INTERMEDIATE TORQUING FIRST STAGE

    | Node 1 Zenith CBM Mate |

    sel First Stage

    | Node 1 CBM Intermediate Torque First Stage |

    cmd IBolt First Stage
    √Confirmation Request - IBolt

    cmd Confirm Cmd
    Wait 2 minutes.
    √Master Cmd Status - Complete
    √Cmd Code (sixteen) - IBolt
    √Cmd Status (sixteen) - Complete
    √Load (sixteen): 0 --- 11150

9. PERFORM INTERMEDIATE TORQUING SECOND STAGE

    | Node 1 Zenith CBM Mate |

    sel Second Stage

    | Node 1 CBM Intermediate Torque Second Stage |

    cmd IBolt Second Stage
    √Confirmation Request - IBolt

cmd Confirm Cmd
  Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 0 --- 15600

10. <u>PERFORM INTERMEDIATE TORQUING THIRD STAGE</u>

  | Node 1 Zenith CBM Mate |

  sel Third Stage

  | Node 1 CBM Intermediate Torque Third Stage |

  cmd IBolt Third Stage
√Confirmation Request - IBolt

  cmd Confirm Cmd
  Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 0 --- 20050

11. <u>PERFORM INTERMEDIATE TORQUING FOURTH STAGE</u>

  | <u>NOTE</u>
Following Fourth Stage of the intermediate torque sequence, all 16 bolts should have preload in the range of 23400 --- 24500 N. Otherwise, step 11 should be repeated until all 16 bolts achieve the specified preload. |

  | Node 1 Zenith CBM Mate |

  sel Fourth Stage

  | Node 1 CBM Intermediate Torque Fourth Stage |

  cmd IBolt Fourth Stage
√Confirmation Request - IBolt

  cmd Confirm Cmd
  Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 23400 --- 24500 else repeat step 11

12. <u>PERFORM INTERMEDIATE TORQUING LAST STAGE</u>

NOTE
Following Last Stage of the intermediate torque sequence, all 16 bolts should have preload in the range of 45650 --- 46750 N. Otherwise, step 12 should be repeated until all 16 bolts achieve the specified preload.

Node 1 Zenith CBM Mate

   sel Last Stage

Node 1 CBM Intermediate Torque Last Stage

   cmd IBolt Last Stage
√Confirmation Request - IBolt

   cmd Confirm Cmd
   Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - IBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 45650 --- 46750 else repeat step 12

13. <u>PERFORM FINAL TORQUING SEQUENCE</u>

NOTE
Following the final torque sequence, all 16 bolts should have preload in the range of 84800 --- 85900 N. Otherwise, step 13 should be repeated until all 16 bolts achieve the specified preload.

Node 1 Zenith CBM Mate

   sel Final Torque

Node 1 CBM Final Torque

   cmd FBolt Nominal
√Confirmation Request - FBolt

   cmd Confirm Cmd
   Wait 2 minutes.
√Master Cmd Status - Complete
√Cmd Code (sixteen) - FBolt
√Cmd Status (sixteen) - Complete
√Load (sixteen): 84800 --- 85900 else repeat step 13

14. CLOSE CAPTURE LATCHES

| Node 1 Zenith CBM Mate |

sel Close Capture Latches

| Node 1 CBM Close Capture Latches |

cmd Close
  Wait 10 seconds.
√Confirmation Request - Close

cmd Confirm Cmd
√Master Cmd Status - Complete
√Cmd Code (four) - Close
√Cmd Status (four) - Complete
√Posn (four): 0 --- 1

15. DEACTIVATE ZENITH CBM MASTER CONTROLLER

| Node 1 Zenith CBM Mate |

sel Deactivate Zenith CBM

| Node 1 Zenith CBM Deactivate CBM |

cmd Deactivate
Mode - Deactivated
Master - None

16. OPEN SECONDARY RPCs

| Node 1 Zenith CBM Mate |

sel RPC 03

| RPCM N14B B RPC 03 |

cmd Open **Execute**
√Position - Open

| Node 1 Zenith CBM Mate |

sel RPC 04

| RPCM N14B B RPC 04 |

cmd Open **Execute**
√Position - Open

| Node 1 Zenith CBM Mate |

sel RPC 05

| RPCM N14B B RPC 05 |

cmd Open **Execute**
√Position - Open

| Node 1 Zenith CBM Mate |

sel RPC 06

| RPCM N14B B RPC 06 |

cmd Open **Execute**
√Position - Open